

2. (a) (i) **Define the term *IP address*.** [2 marks]

A unique number that identifies a resource on a network [1 mark], plus any one of the additional points below [2 marks].

- consists of 4 octets
- each of 8 bits / 1 byte
- each contains a number from 0–255
- octets are separated by dots
- would be written as 36.134.200.5 for example.

(ii) **Describe the relationship between the server and a client in a network.** [2 marks]

- Client-server identifies the relationship between two different network components/computers, *i.e.* the client program on the computer requests services, and the server program provides those services.

*Award [1 mark] for a statement that correctly identifies both of the network components *i.e.* client machine and server machine, and award [1 mark] for correctly identifying the relationship between the two different network components/computers. For example, the client requests services and the server provides them. Award a maximum of [2 marks] for the response.*

(iii) **Identify two steps a DNS server takes to help a user locate a particular web page.** [2 marks]

Answers may include the following steps:

- DNS server stores IP addresses and equivalent domain names
- user enters (easy to remember) domain name in their browser
- DNS server looks up IP address
- DNS server substitutes IP address for the domain name.

Award [1 mark] for each correct step identified up to a maximum of [2 marks].

- (b) (i) Explain *one* reason why a user may use more than one web browser. [2 marks]

Answers may include the following reasons:

- web browsers differ in facilities offered
- users need to access company websites using the recommended web browser
- some web browsers have better security
- some web browsers have useful/different add-ons
- some web browsers are open source and can be modified.

Award [1 mark] for each type of appropriate reason identified, and [1 mark] for the explanation of that reason up to a maximum of [2 marks].

- (ii) Explain *two* reasons why the illegal copying of music on a P2P network is more difficult to prosecute than that on client-server networks. [4 marks]

Answers may include the following reasons:

- no single location for the illegal files, therefore cannot identify single IP address
- source may be different each time user accesses resource so difficult to know who to pursue
- users may be online only for a short time so it cannot be determined if they are guilty
- more legitimate traffic on users' computers so more difficult to identify illicit material.

Award [1 mark] for each appropriate reason identified up to a maximum of [2 marks], and [1 mark] for an appropriate explanation of each reason up to a maximum of [2 marks]. Award a maximum of [4 marks] for the answer.

- (c) **A company is based at various geographical locations. The senior managing team is considering the use of web-based P2P networking in order to make business-related files available to its staff. To what extent would this be an effective way to share its business data?**

[8 marks]

Answers may include:

Advantages

- In a pure P2P architecture there is no single point of failure; that means, if one peer breaks down, the rest of the peers are still able to communicate.
- P2P provides the opportunity to take advantage of unused resources such as processing power for computations and storage capacity. In client-server architectures, the centralized system bears the majority of the cost of the system. In P2P, all peers help spread the cost.
- P2P can prevent bottlenecks such as traffic overload using a central server architecture, because P2P can distribute data and balance request across the net without using a central server.
- There is better scalability due to a lack of centralized control and because most peers interact with each other.

Disadvantages

- Today, many applications need a high security standard, which is not satisfied by current P2P solutions.
- The connections between the peers are normally not designed for high throughput rates, even if the coverage of ADSL and cable modem connections is increasing.
- A centralized system or a client-server system will work as long as the service provider keeps it up and running. If peers start to abandon a P2P system, services will not be available to anyone.
- Most search engines work best when they can search a central database rather than launch a meta search of peers.
- Most networks using client-server architecture will have a network manager assigned to the maintenance of the network. A P2P network may be managed on an ad-hoc basis.
- Many business-related files need to be updated by a variety of employees. If copies of files are allowed to proliferate with a loss of control over updating, then serious problems will ensue.

In part (c) of this question it is expected there will be a balance in the ITGS terminology between IT technical terminology and the terminology related to social and ethical impacts.

Please see generic markband information sheet on page 18.

3. (a) (i) State *two* file formats, other than Flash (FLV), that could be used to store the video in Item 2 shown above. [2 marks]

Answers may include:

- AVI
- MOV
- MPEG-3 or MP3
- MPEG-4 or MP4
- Real Media.

Award [1 mark] for each file format stated up to a maximum of [2 marks].

- (ii) The Australian government uses the online tax and welfare databases to provide services to their citizens and to find persons who try to avoid paying taxes. Outline the steps involved in using data matching for these purposes. [4 marks]

Answers may include the following steps:

- open tax database
- open welfare database
- look at one individual's record from one database
- search other database for match
- look for inconsistencies between records
- if there are inconsistencies, then carry out an investigation
- repeat for other records.

Award [1 mark] for each correct step identified in sequence, up to a maximum of [4 marks].

- (b) Governments normally have policies on their website describing how they safeguard the privacy of their citizens. Explain *three* policies that might be included and how they protect the privacy of citizens. [6 marks]

Answers may include the following policies and reasons:

- process is audited externally – to reassure that process of data collection is carried out properly/fairly
- data collection is done legally – to assure that no improper intrusion is used
- only used for intended purpose – to avoid problems that emerge (*i.e.* data matching, unsolicited advertising)
- disclosure: only seen by authorized persons – to avoid the leakage of personal information
- data quality: data held is accurate – to prevent problems that may result from the use of inaccurate data
- data security: data is looked after properly (*e.g.* not sent on CD-ROMs by post) – to prevent personal information being accessed by unauthorized persons
- openness: no secret data collected – to prevent data being used for purposes unknown to individuals
- access and correction: persons can check that their personal information is correct – to allow the person to see the information held about them and avoid problems that emerge from incorrect information being used
- identifiers: persons cannot be identified from any statistical publications – to avoid the exposure of personal information and subsequent results
- trans-border data flows: data not exported to untrustworthy countries – to avoid unauthorized access to personal information by corrupt persons (*i.e.* sharing of personal banking details).

Award [1 mark] for each type of appropriate policy identified, and [1 mark] for each appropriate explanation of how that policy will protect the privacy of its citizens up to a maximum of [2 marks] for each policy. Award a maximum of [6 marks] for the answer.

- (c) The website *smartraveller.gov.au* enables the Australian government to provide tips for business travellers relating to issues such as health warnings, entry and visa requirements, and travel advice. Travellers can submit a form to register their emergency contact details, and can also visit the website and subscribe to RSS feeds. Previously, this information was only available by telephoning the government office.

Discuss the business travellers' use of the government website (*smartraveller.gov.au*) to access the information that they require.

[8 marks]

Answers may include:

Advantages

- can always be up to date
- immediate access to the information on the website (*i.e.* no waiting to get through on the telephone, no problem locating right person)
- can print the information
- can select what is needed
- information on a government website is reliable.

Disadvantages

- need appropriate computing technologies with internet access
- might take a while to find what you want, website may not be intuitive
- the website may not provide all of the information required (*i.e.* might be better to talk to someone who can advise you if you have a particular requirement).

In part (c) of this question it is expected there will be a balance in the ITGS terminology between IT technical terminology and the terminology related to social and ethical impacts.

Please see generic markband information sheet on page 18.